

***NATIONAL WEATHER SERVICE INSTRUCTION 10-519***

***August 31, 2013***

***Operations and Services***

***Public Weather Services, NWSPD 10-5***

***WFO AIR QUALITY PRODUCTS SPECIFICATION***

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**NOTICE:** This publication is available at: <http://www.nws.noaa.gov/directives/>.

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**OPR:** W/OS22 (P. Stokols)

**Certified by:** W/OS22 (E. Jacks)

**Type of Issuance:** Routine

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***SUMMARY OF REVISIONS:*** This directive supersedes National Weather Service Instruction 10-519, “WFO Air Quality Products Specification” dated, Aug. 5, 2010.

1. Clarification was made in Section 3.2.2.1 that AQAs would be issued whenever AQI values are at least 101 (Unhealthy to Sensitive Groups) or Code Orange or higher.
2. Updates were made to links and some wording Appendix 3.2 and 3.3

Signed

8/14/13

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Date

## WFO Air Quality Products Specification

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1. **Introduction.** This procedural instruction provides product specifications for external air quality messages relayed by National Weather Service (NWS) Weather Forecast Offices (WFOs). This instruction neither changes the method of interactions between NWS and state and local air quality forecasters, nor requires NWS forecasters to initiate messages for state and local air quality forecasters. This instruction provides a standardized template for relaying air quality messages generated by state and local air quality forecasters should they request their local WFOs to do so. Template specifications include the guidelines associated with these products, detailed content, and format for each product type. Air quality alerts and statements are not prepared directly by WFO staff. The function of initiating and issuing air quality messages is performed by state and local air quality forecasters. The NWS' sole function in this process is providing, on request, a means of disseminating these state and locally issued air quality messages.

2. **Air Quality Statement (AQI).** The AQI product is used by WFOs to relay routine air quality messages issued by state and local agencies.

2.1 **Mission Connection.** The AQI is a non-technical product which relays routine air quality information compiled by state and local air quality agencies. The content of this message varies widely from state to state, and often from jurisdiction to jurisdiction. Some examples of information contained in these messages include:

- Pollen Count
- Environmental Protection Agency (EPA) Air Quality Index (AQI)
- Gross Mold Count
- Air Quality Index Code Level for the day (Green, Yellow, Orange, Red)
- Source of Pollution (ozone, smoke, particulate matter (PM), etc.)
- Sky Condition relating to air pollution-induced haze

WFOs are only responsible for the dissemination of these messages, not the content. Any content issues are relayed to the issuing state or local agency.

2.2 **Issuance Guidelines.**

2.2.1 **Creation Software.** The AQI should be composed using the Advanced Weather Interactive Processing System (AWIPS) Interactive Forecast Preparation System (IFPS) preformatted AQI shell, or other text editor.

2.2.2 **Issuance Criteria.** The AQI product will be relayed by WFOs for all routine air quality messages issued by the state or local agencies within the WFO's area of responsibility per state/local agency agreement. The following guidelines are to be used to delineate a routine and a non-routine product issuance.

2.2.2.1 **Routine Issuances.** All routine issuances of air quality messages will be disseminated under the AQI product header. A message should be considered routine when it is issued for sub health-threatening threshold levels or is scheduled such as when:

- a. The EPA's Air Quality Index value is between 0 and 100 (see Appendix for color-coded table and explanation of the EPA Air Quality Index)
- b. A "Code Level" or the "Level of Health Concern" is forecast to be Low or Moderate (green or yellow)
- c. The "Skycast" is forecast to be yellow or green
- d. It is issued daily at the request of the local/state air quality agency

Issuing agencies can set higher thresholds for areas which normally experience higher levels of pollutants.

If the above guidelines/thresholds are exceeded, then a non-routine message will be relayed with an Air Quality Alert Message (AQA) product header, which is described in Section 3 of this instruction.

2.2.3 Issuance Time. The issuance time of the AQI varies from WFO to WFO. It is dependent upon the frequency with which state or local agencies issue their messages. In some cases, products will be issued once per day in one WFO, while another WFO may relay hourly messages.

2.2.4 Valid Time. AQIs are valid from time of release until the next release or as specified by the issuing agency.

2.2.5 Product Expiration Time. AQIs are not required to contain a product expiration time. If WFO wishes to put an expiration time on the product, it will require coordination with the state and local agency which issues the message.

2.3 Technical Description. AQIs should follow the format and content described in the following section.

2.3.1 Universal Geographic Code (UGC) Type. There is no UGC coding associated with the AQI product.

2.3.2 Mass News Disseminator (MND) Broadcast Instruction Line. There is no MND Broadcast Instruction Line associated with this product.

2.3.3 MND Product Type Line. The product header of the AQI varies from WFO to WFO, and is dependant on the product header issued by state and local agencies. However, all AQIs will always include the phrase "RELAYED BY NATIONAL WEATHER SERVICE (insert WFO name here)" under the product header or issuing agencies.

Some example product headers (determined by the issuing state/local agency or agencies) which appear on the AQI are:

- a. Air Quality Index Forecast

- b. Daily AQI Report
- c. Air Pollution Standard Index
- d. Air Quality Index
- e. Air Quality Report
- f. Air Quality Index Statement
- g. Pollution Index/Pollen Count
- h. Pollution Standards Index (PSI)

2.3.4 Content. As stated previously in this section, the content of the AQI will be determined by the issuing state or local agency. The WFO's sole purpose is to serve as a dissemination means for these routine air quality messages. Changes in content need to be coordinated with the issuing agency or agencies.

FXaaii cccc ddhhmm AQIxxx	<i>WMO heading (AEUS7x)</i> <i>AWIPS ID</i>
<u>Product Format</u>	<u>Description of Entry</u>
PRODUCT HEADER (see section 2 for examples)	<i>(MND/NWS Product Name)</i>
NAME(S) OF AGENCY (AGENCIES) ISSUING MESSAGE (optional)	<i>(Issuing Agency or Agencies)</i>
RELAYED BY NATIONAL WEATHER SERVICE city state	<i>(Issuing Office)</i>
time am/pm time_zone day mon dd yyyy	<i>(Issuing Time/Date)</i>
...[headline to highlight any topical forecast information]...	<i>(Topical Headline - Optional)</i>
[Content to be defined by issuing agency or agencies]	
## or \$\$	

**Figure 1.** Air Quality Statement (AQI) Product Format.

2.4 Updates and Corrections. Any updates or corrections to the AQI will be issued by the issuing state or local agency, or need to be coordinated with the issuing agency.

3. **Air Quality Alert Message (AQA)**. The AQA product is used by WFOs to relay non-routine air quality alert messages issued by state and local agencies.

3.1 Mission Connection. The AQA is a non-technical product which relays non-routine air quality alerts and information compiled by state and local air quality agencies. As with the AQI product, the content of these messages, as well as the type of alerts, varies widely from state to state, and often from jurisdiction to jurisdiction.

3.2 Issuance Guidelines.

3.2.1 Creation Software. The AQA should be created using the AWIPS GFE Formatter Launcher application. In addition, a web interface has been developed that will allow the issuing state or local agency to send a work text file directly to the WFO AWIPS workstation for automatic incorporation to the GFE Formatter Launcher.

3.2.2 Issuance Criteria. The AQA product will be relayed by WFOs for all requested non-routine air quality alert messages issued by the state or local agencies within the WFO's area of responsibility. The following guidelines are to be used to delineate a non-routine product issuance (routine product issuances are discussed in Section 2.2.2.1).

3.2.2.1 Non-Routine Issuances. All non-routine issuances of air quality alert messages will be disseminated under the AQA product header. A message should be considered non-routine whenever any of the following conditions are met:

- a. A product received from the issuing agency contains a headline indicating that a watch/advisory/alert/warning is in effect
- b. The EPA's Air Quality Index value is at least 101 (Unhealthy for Sensitive Groups - please see Appendix 3 for color-coded table and explanation of the EPA Air Quality Index) or higher
- c. The "Code Level" or the "Level of Health Concern" is forecast to be Code Orange or higher
- d. The "Skycast" is forecast to be red

Issuing agencies can set higher thresholds for areas which normally experience higher levels of pollutants. In addition, other unique alert thresholds from state and local agencies may also be utilized to trigger NWS AQA messages to meet local user needs.

3.2.3 Issuance Time. The issuance time of the AQA varies from WFO to WFO. It is dependent upon the frequency with which state or local agencies issue their messages.

3.2.4 Valid Time. AQAs are valid from time of release until the next release, or, until the alert is no longer in effect.

3.2.5 Product Expiration Time. State or local air quality officials should designate the product expiration time of the air quality alert message. If not designated, WFOs should coordinate with state or local air quality agencies to determine an expiration time.

3.3 Technical Description. AQAs should follow the format and content described in the following section.

3.3.1 UGC Type. All WFOs are to use zone coding as the UGC coding for the AQA product.

3.3.2 MND Broadcast Instruction Line. There is no MND Broadcast Instruction Line associated with this product.

3.3.3 MND Product Type Line. The product header of the AQA will always be "AIR QUALITY ALERT MESSAGE", and will also include the phrase "RELAYED BY NATIONAL WEATHER SERVICE (insert WFO name here)" under the product header or issuing agencies. The product header as received from the issuing state or local agency or agencies will serve as the headline for the text of the product. Some examples of headlines which will be used are:

- a. Ozone Alert

- b. Ozone Warning
- c. Air Quality Health Alert
- d. Air Quality Watch
- e. Air Quality Warning
- f. Air Quality Advisory
- g. Ozone Action Day
- h. EPA Air Quality Warning
- i. Air Quality Action Day

3.3.4 Content. As stated previously in this section, the content of the AQA will be determined by the issuing state or local agency. The WFO's sole purpose is to serve as the dissemination means for these non-routine air quality messages. Changes in content need to be coordinated with the issuing agency or agencies.

FXaaii cccc ddhhmm	<b>WMO heading (AEUS7x)</b>
AQAxxx	<b>AWIPS ID</b>
st##...-ddhhmm-	<b>UGC zone coding/expiration time</b>
<u>Product Format</u>	<u>Description of Entry</u>
AIR QUALITY ALERT MESSAGE	<b>(MND/NWS Product Name)</b>
NAME(S) OF AGENCY (AGENCIES) ISSUING MESSAGE	<b>(Issuing Agency or Agencies)</b>
RELAYED BY NATIONAL WEATHER SERVICE city state	<b>(Issuing Office)</b>
time am/pm time_zone day mon dd yyyy	<b>(Issuing Time/Date)</b>
...[headline to highlight alert/watch/warning in effect] ...	<b>(Topical Headline)</b>
[Content to be defined by issuing agency or agencies]	
## or \$\$	

**Figure 2.** Air Quality Alert Message (AQA) Product Format.

3.4 Updates and Corrections. Any updates or corrections to the AQA will be issued by the issuing state or local agency, or need to be coordinated with the issuing agency.

**APPENDIX – Product Examples and Air Quality Resources**

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1. Air Quality Statement (AQI) Examples

**a. Issuance with Expiration Time (time of next scheduled issuance):**

AEUS71 Kccc 152032

AQIccc

ssZ022-162000-

AIR QUALITY INDEX FORECAST

RELAYED BY NATIONAL WEATHER SERVICE WFO NAME

430 PM EDT SUN JUL 15 2012

AIR QUALITY FORECASTS FOR THE EXAMPLE AREA ARE PROVIDED BY  
THE STATE DEPARTMENT OF ENVIRONMENTAL QUALITY.

...THE EXAMPLE AREA FORECAST FOR MONDAY...

CODE LEVEL YELLOW WHICH IS MODERATE...POLLUTANT IS PARTICLES.

\$\$

**b. Issuance with Issuing Agency listed in MND header:**

AEUS74 Kccc 161350

AQIccc

ssZ025-161500-

AIR QUALITY INDEX STATEMENT

STATE DEPARTMENT OF ENVIRONMENTAL QUALITY

RELAYED BY THE NATIONAL WEATHER SERVICE WFO NAME

849 AM CDT MON JUL 16 2012

THE FOLLOWING STATEMENT WAS ISSUED BY THE STATE DEPARTMENT OF  
ENVIRONMENTAL QUALITY.

THIS MORNING AT 8 AM, THE AIR POLLUTION STANDARD INDEX FOR STATE SITE  
WAS 45... WITH THE AIR QUALITY RATED GOOD. THE PRIMARY  
POLLUTANT WAS OZONE.

\$\$

FOR FURTHER INFORMATION, TELEPHONE THE STATE DEPARTMENT OF  
ENVIRONMENTAL QUALITY AT 405-702-4100.

WHEN THE AIR POLLUTION STANDARD INDEX IS LESS THAN 100, NO  
PRECAUTIONS ARE NECESSARY.

\$\$

**c. Hourly Issuance of Product:**

AEUS73 Kccc 161440  
AQIccc  
CITY STATE AIR QUALITY INDEX  
ISSUED BY CITY METRO AIR POLLUTION CONTROL DISTRICT  
RELAYED BY NATIONAL WEATHER SERVICE WFO NAME  
1038 AM EDT MON JUL 16 2012

10:00 AM INDEX ..... 59

ELEVATED POLLUTANT ..... FINE PARTICULATES

CURRENT CATEGORY ..... MODERATE RANGE

SHORT TERM FORECASTS ..... OZONE: MODERATE RANGE.  
FINE PARTICULATES: MODERATE RANGE.

\$\$

**2. Air Quality Alert Message (AQA) Examples**

**a. Counties listed in body of message:**

AEUS71 Kccc 091818  
AQAccc  
ssZ063>066-110500-

AIR QUALITY ALERT MESSAGE  
STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
RELAYED BY NATIONAL WEATHER SERVICE WFO NAME  
218 PM EDT MON JUL 9 2012

...AIR QUALITY ALERT IN EFFECT FROM 1 PM TUESDAY TO 1 AM WEDNESDAY...

THE STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION HAS ISSUED  
AN AIR QUALITY HEALTH ADVISORY FOR THE FOLLOWING COUNTIES...

COUNTY1...COUNTY2.

AIR QUALITY LEVELS IN OUTDOOR AIR ARE PREDICTED TO BE GREATER  
THAN AN AIR QUALITY INDEX VALUE OF 100 FOR THE POLLUTANT OF  
OZONE. THE AIR QUALITY INDEX...OR AQI...WAS CREATED AS AN EASY  
WAY TO CORRELATE LEVELS OF DIFFERENT POLLUTANTS TO ONE SCALE. THE  
HIGHER THE AQI VALUE, THE GREATER THE HEALTH CONCERN.

WHEN POLLUTION LEVELS ARE ELEVATED...THE STATE DEPARTMENT OF HEALTH  
RECOMMENDS THAT INDIVIDUALS CONSIDER LIMITING STRENUOUS OUTDOOR  
PHYSICAL ACTIVITY TO REDUCE THE RISK OF ADVERSE HEALTH EFFECTS.  
PEOPLE WHO MAY BE ESPECIALLY SENSITIVE TO THE EFFECTS OF ELEVATED  
LEVELS OF POLLUTANTS INCLUDE THE VERY YOUNG, AND THOSE WITH  
PRE-EXISTING RESPIRATORY PROBLEMS SUCH AS ASTHMA OR HEART DISEASE.  
THOSE WITH SYMPTOMS SHOULD CONSIDER CONSULTING THEIR PERSONAL  
PHYSICIAN.

A TOLL FREE AIR QUALITY HOTLINE HAS BEEN ESTABLISHED SO STATE  
RESIDENTS CAN STAY INFORMED ON THE AIR QUALITY SITUATION. THE TOLL FREE  
NUMBER IS: 1 800 123 4567.

\$\$

**b. Counties listed in header:**

AEUS71 Kccc 101552  
AQAccc

AIR QUALITY ALERT MESSAGE  
STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
RELAYED BY NATIONAL WEATHER SERVICE WFO NAME  
1152 AM EDT TUE JUL 10 2012

ssZ067-068-110500-  
COUNTY1-COUNTY2-  
1152 AM EDT TUE JUL 10 2008

...AIR QUALITY ALERT IN EFFECT FROM 11 AM THIS MORNING TO 1 AM EDT  
WEDNESDAY...

THE STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION HAS  
ISSUED AN AIR QUALITY HEALTH ADVISORY...IN EFFECT FROM 11 AM THIS  
MORNING TO 1 AM EDT WEDNESDAY.

OUTDOOR AIR QUALITY INDEX...OR AQI...VALUES IN EXCESS OF 100 ARE  
EXPECTED WITH OZONE BEING THE PRIMARY POLLUTANT. THE AQI WAS  
CREATED AS AN EASY WAY TO CORRELATE LEVELS OF DIFFERENT POLLUTANTS  
TO ONE SCALE. THE HIGHER THE AQI VALUE, THE GREATER THE HEALTH  
CONCERN.

WHEN POLLUTION LEVELS ARE ELEVATED...THE STATE DEPARTMENT  
OF HEALTH RECOMMENDS THAT INDIVIDUALS CONSIDER LIMITING STRENUOUS  
OUTDOOR PHYSICAL ACTIVITY TO REDUCE THE RISK OF ADVERSE HEALTH  
EFFECTS. PEOPLE WHO MAY BE ESPECIALLY SENSITIVE TO THE EFFECTS OF  
ELEVATED LEVELS OF POLLUTANTS INCLUDE THE VERY YOUNG, AND THOSE WITH  
PRE-EXISTING RESPIRATORY PROBLEMS SUCH AS ASTHMA OR HEART DISEASE.  
THOSE WITH SYMPTOMS SHOULD CONSIDER CONSULTING THEIR PERSONAL  
PHYSICIAN.

A TOLL FREE AIR QUALITY HOTLINE HAS BEEN ESTABLISHED SO STATE  
RESIDENTS CAN STAY INFORMED ON THE AIR QUALITY SITUATION. THE TOLL  
FREE NUMBER IS: 1 800 123 4567.  
\$\$

### 3. Air Quality Resources

#### 3.1 Environmental Protection Agency's Air Quality Index

The Air Quality Index (AQI) is an index for reporting daily air quality. It tells how clean or polluted air is, and what associated health effects might be a concern for the public. The AQI ranges from 0 to 500. An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level EPA has set to protect public health. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy-at first for certain sensitive groups of people, then for everyone as AQI values get higher.

##### **AQI colors**

EPA has assigned a specific color to each AQI category to make it easier for people to understand quickly whether air pollution is reaching unhealthy levels in their communities. For example, the color orange means that conditions are "unhealthy for sensitive groups," while red means that conditions may be "unhealthy for everyone," and so on.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	> 300	Health warnings of emergency conditions. The entire population is more likely to be affected.

**Figure 3. EPA's Air Quality Index Colors**

3.2 Air Quality Guidance Products. NOAA's NWS produces daily air quality forecast guidance which is used by state and local agencies to assist them with issuing their forecasts and alerts, which are also disseminated by the EPA. Three types of guidance are produced: 1-hour and 8-hour average ozone concentrations and their daily maxima for the Nation, smoke forecast guidance from 0 to 48 hours for the Nation, and dust forecast guidance for the contiguous US. These products are described in detail in NWS Instruction 10-516, [National Non-Precipitation Weather Products Specification](#), Section 6.

3.3 Useful Air Quality Weblinks/Information. The following are a list of useful resources for additional air quality information:

NWS Air Quality Forecast Guidance:

Operational Products

Experimental Products

<http://airquality.weather.gov/expr/>

NWS National Air Quality Forecast Capability:

[http://www.weather.gov/ost/air\\_quality/](http://www.weather.gov/ost/air_quality/)

EPA's AIRNOW webpage:

<http://airnow.gov/>

Basic Air Quality Training

[http://www.wdtd.noaa.gov/modules/Air\\_Quality/player.html](http://www.wdtd.noaa.gov/modules/Air_Quality/player.html)

Information on Air Stagnation Advisories (NPW Product):

<http://www.nws.noaa.gov/directives/sym/pd01005015curr.pdf>

Note: The NPW Air Stagnation Advisory (AS.Y) product is an advisory issued by NWS WFOs to describe meteorological conditions that yield stagnating air. AQA/AQI products are relayed by the NWS at the request of a local or state air quality agency.